

WHAT IS CLAIMED IS:

1. A composite high frequency component constituting a part of a microwave circuit having plural signal paths corresponding to their respective frequencies, comprising:

a diplexer for coupling transmitting signals from the plural signal paths for transmission and distributing receiving signals into said plural signal paths for reception; plural high frequency switches for separating the plural signal paths into a transmission section and a reception section, respectively;

plural filters introduced in the signal paths;

said diplexer, said high frequency switch, and said filters being integrated into a ceramic multi-layer substrate formed by lamination of plural ceramic sheet layers.

2. The composite high frequency component according to Claim 1, wherein the plural filters are connected to the transmission section sides which are in the latter stage with respect to the high frequency switches.

3. The composite high frequency component according to Claim 1, wherein each of the plural filters is a notch filter.

4. The composite high frequency component according to Claim 2, wherein each of the plural filters is a notch filter.

5. The composite high frequency component according to Claim 1, wherein the diplexer is composed of a first inductance element and a first capacitance element, each of the plural high frequency switches is composed of a switching element, a second inductance element, and a second capacitance element, and each of

the plural filters is composed of a third inductance element and a third capacitance element, and

the switching elements, the first through third inductance elements, and the first through third capacitance elements are contained in or mounted onto the ceramic multi-layer substrate and connected by means of a connecting means formed inside the ceramic multi-layer substrate.

6. The composite high frequency component according to Claim 5, wherein the second inductance elements constituting the plural high frequency switches contain parallel trap coils and choke coils, and said parallel trap coils and said choke coils are formed of chip coils.

7. A mobile communication device including the composite high frequency component according to Claim 1.

8. A composite high frequency component constituting a part of a microwave circuit having plural signal paths corresponding to their respective frequencies, comprising:

a diplexer for coupling transmitting signals from the plural signal paths for transmission and distributing receiving signals into said plural signal paths for reception; plural high frequency switches for separating the plural signal paths into a transmission section and a reception section, respectively;

plural filters introduced in the signal paths;

each of said plural high frequency switches including a first switching element connected to the transmission section side and a second switching element connected to the reception section side; and

said plural high frequency switches being on-off controllable with a first common controlling power supply connected to the plural high frequency switches on the transmission section sides thereof.

9. The composite high frequency component according to Claim 8 or 8, wherein the plural filters are arranged between the plural high frequency switches and the transmission section sides, respectively.

10. A composite high frequency component according to any one of Claim 8, wherein the diplexer, the plural high frequency switches, and the filters are integrated into a ceramic multi-layer substrate composed of plural ceramic sheet layers laminated together.

11. A mobile communication device including the composite high frequency component according to any one of Claim 8.

12. A composite high frequency component constituting a part of a microwave circuit having plural signal paths corresponding to their respective frequencies, comprising:

a diplexer for coupling transmitting signals from the plural signal paths for transmission and distributing receiving signals into said plural signal paths for reception; plural high frequency switches for separating the plural signal paths into a transmission section and a reception section, respectively;

plural filters introduced in the signal paths;

each of said plural high frequency switches including a first switching element connected to the transmission section side and a second switching element connected to the reception section side;

said plural high frequency switches being on-off controllable with a first common controlling power supply connected to the plural high frequency switches on the transmission section sides thereof and a second common controlling power supply connected to the high frequency switches on the reception sides thereof.

13. The composite high frequency component according to Claim 12, wherein the plural filters are arranged between the plural high frequency switches and the transmission section sides, respectively.

14. A composite high frequency component according to Claim 12, wherein the diplexer, the plural high frequency switches, and the filters are integrated into a ceramic multi-layer substrate composed of plural ceramic sheet layers laminated together.

15. A composite high frequency component according to Claim 14, wherein the diplexer is composed of first inductance elements and first capacitance elements, each of the plural high frequency switches is composed of the first switching element and the second switching element, second inductance elements, and second capacitance elements, and each of the plural filters is composed of a third inductance element and third capacitance elements, and

the first switching elements and the second switching elements, the first through third inductance elements, and the first through third capacitance elements are contained in or mounted onto the ceramic multi-layer substrate and connected by means of a connecting means formed inside the ceramic multi-layer substrate.

16. The composite high frequency component according to Claim 15, wherein the second inductance element constituting each of the plural high frequency switches is formed of a choke coil, and the choke coil is integrated into the ceramic multi-layer substrate.

17. A mobile communication device including the composite high frequency component according to Claim 12.

18. A composite high frequency component provided with a front end portion so formed as to correspond to first and second communication systems operative at adjacent frequencies, and a third communication system operative at a frequency different from those of the first and second communication systems, comprising:

a diplexer for coupling transmitting signals from said first through third communication systems in the case of transmission and for distributing receiving signals to said first through third communication systems in the case of reception;

a first high frequency switch for separating the transmission section of said first and second communication systems and the reception section of the first and second communication systems from each other;

a second high frequency switch for separating the reception section of the first communication system and the reception section of the second communication system from each other;

a third high frequency switch for separating the transmission section of said third communication system and the reception section thereof from each other;

a first filter for passing transmission - reception signals of said first and second communication systems; and

a second filter for passing transmission - reception signals of said third communication systems; and

the composite high frequency component being integrated into a ceramic multi-layer substrate formed by lamination of plural ceramic sheet layers.

19. The composite high frequency component according to Claim 18, wherein at least one of said first and second filters is arranged in the post-stage with respect to the high frequency switch.

20. The composite high frequency component according to Claim 18, wherein the diplexer comprises a first inductance element and a first capacitance element, each of the first through third high frequency switches comprises first and second switching elements, second inductance elements, and second capacitance elements, and each of the first and second filters comprises a third inductance element and a third capacitance element;

said first through third inductance elements, said first through third capacitance elements, and said first and second switching elements being contained in or mounted onto said ceramic multi-layer substrate and connected by a connecting means formed inside said ceramic multi-layer substrate.

21. A mobile communication system including the composite high frequency component according to Claim 14.